

year period), the limits specified in Table 2 would be multiplied by 10. The basis for Table 2 is an upper limit on long term risks of 1,000 health effects over 10,000 years for a repository containing wastes generated from 100,000 metric tons of heavy metal of reactor fuel. For releases involving more than one radionuclide, the allowed release for each radionuclide is reduced to the fraction of its limit that insures that the overall limit on harm is not exceeded. Additionally, to provide confidence needed for compliance with the containment requirements specified above, §191.14, "Assurance Requirements", specifies the disposal of radioactive waste in accordance with seven requirements, relating to prompt disposal of waste; selection and design of disposal systems to keep releases to the accessible environment as small as reasonably achievable; engineered and natural barriers; nonreliance on active institutional controls after closure; passive controls after closure; natural resource areas; and design of disposal systems to allow future recovery of wastes.

The guidelines will be revised as necessary after the adoption of final regulations by the EPA.

The implementation of 40 CFR part 191, subpart B is required by 10 CFR 60.112. 10 CFR 60.113 establishes minimum conditions to be met for engineered components and ground-water flow; specifically: (1) Containment of radioactive waste within the waste packages will be substantially complete for a period to be determined by the NRC taking into account the factors specified in 10 CFR 60.113(b) provided that such period shall be not less than 300 years nor more than 1,000 years after permanent closure of the geologic repository; (2) the release rate of any radionuclide from the engineered barrier system following the containment period shall not exceed one part in 100,000 per year of the inventory of that radionuclide calculated to be present at 1,000 years following permanent closure, or such other fraction of the inventory as may be approved or specified by the NRC, provided that this requirement does not apply to any radionuclide which is released at a rate less than 0.1% of the calculated total release rate limit. The calculated total release rate limit shall be taken to be one part in 100,000 per year of the inventory of radioactive waste originally emplaced in the underground facility that remains after 1,000 years of radioactive decay; and (3) the geologic repository shall be located so that pre-waste-emplacment ground-water travel time along the fastest path of likely radionuclide travel from the disturbed zone to the accessible environment shall be at least 1,000 years or such other travel time as may be approved or specified by the NRC.

The guidelines will be revised as necessary to ensure consistency with 10 CFR part 60.

#### APPENDIX II TO PART 960—NRC AND EPA REQUIREMENTS FOR PRECLOSURE REPOSITORY PERFORMANCE

Under proposed 40 CFR part 191, subpart A—*Environmental Standards for Management and Storage*, Section 191.03, "Standards for Normal Operations", specifies: (1) That operations should be conducted so as to reduce exposure to members of the public to the extent reasonably achievable, taking into account technical, social, and economic considerations; and (2) that, except for variances permitted for unusual operations under Section 191.04 as an upper limit, normal operations shall be conducted in such a manner as to provide reasonable assurance that the combined annual dose equivalent to any member of the public due to: (i) operations covered by 40 CFR part 190, (ii) planned discharges of radioactive material to the general environment from operations covered by this subpart, and (iii) direct radiation from these operations; shall not exceed 25 millirems to the whole body, 75 millirems to the thyroid, or 25 millirems to any other organ.

The guidelines will be revised as necessary after the adoption of final regulations by the EPA.

The implementation of 40 CFR part 191, subpart A and 10 CFR part 20 is required by 10 CFR 60.111. 10 CFR 60.111 also specifies requirements for waste retrieval, if necessary, including considerations of design, backfilling, and schedule. 10 CFR part 20 establishes (a) exposure limits for operating personnel and (b) permissible concentrations of radionuclides in uncontrolled areas for air and water. The latter are generally less restrictive than 40 CFR 191, subpart A, but may be limiting under certain conditions (i.e., if used as a maximum for short durations rather than annual averages).

The guidelines will be revised as necessary to ensure consistency with 10 CFR part 60.

#### APPENDIX III TO PART 960—APPLICATION OF THE SYSTEM AND TECHNICAL GUIDELINES DURING THE SITING PROCESS

1. This appendix presents a table that specifies how the guidelines of subparts C and D are to be applied at certain decision points of the siting process. The decision points, as referenced in the table, are defined as follows:

"Potentially acceptable" means the decision point at which a site is identified as potentially acceptable.

“Nomination and recommendation” means the decision point at which a site is nominated as suitable for characterization or recommended as a candidate site for characterization.

2. The findings resulting from the application of a disqualifying condition for any particular guideline at a given decision point are denoted in the table by the numeral 1 or 2. The numerals 1 and 2 signify the types of findings that are required and are defined as follows:

“1” means *either* of the following:

(a) The evidence does *not* support a finding that the site is disqualified.

*or*

(b) The evidence supports a finding that the site is disqualified.

“2” means *either* of the following:

(a) The evidence supports a finding that the site is *not* disqualified on the basis of that evidence and is *not* likely to be disqualified.

*or*

(b) The evidence supports a finding that the site is disqualified or is likely to be disqualified.

3. The findings resulting from the application of a qualifying condition for any particular guideline at a given decision point are denoted in the table by the numeral 3 or 4. The numerals 3 and 4 signify the types of findings that are required and are defined as follows:

“3” means *either* of the following:

(a) The evidence does *not* support a finding that the site is *not* likely to meet the qualifying condition.

*or*

(b) The evidence supports a finding that the site is *not* likely to meet the qualifying condition, and therefore the site is disqualified.

4. If performance assessments are used to substantiate any of the above findings, those assessments shall include estimates of the effects of uncertainties in data and modeling.

5. For both the disqualifying and qualifying conditions of any guideline, a higher finding (e.g., a “2” finding rather than “1”) shall be made if there is sufficient evidence to support such a finding.

FINDINGS RESULTING FROM THE APPLICATION OF THE QUALIFYING AND DISQUALIFYING CONDITIONS OF THE TECHNICAL GUIDELINES AT MAJOR SITING DECISIONS

Section 960	Guideline	Condition	Siting decision	
			Potentially acceptable	Nomination and recommendation
4-1(a)	System	Qualifying		3
4-2-1(a)	Geohydrology	.....do		3
4-2-1(d)	.....do	Disqualifying		1
4-2-2(a)	Geochemistry	Qualifying		3
4-2-3(a)	Rock Characteristics	.....do		3
4-2-4(a)	Climatic Changes	.....do		3
4-2-5(a)	Erosion	.....do		3
4-2-5(d)	.....do	Disqualifying	1	1
4-2-6(a)	Dissolution	Qualifying		3
4-2-6(d)	.....do	Disqualifying	1	1
4-2-7(a)	Tectonics	Qualifying		3
4-2-7(d)	.....do	Disqualifying	1	1
4-2-8-1(a)	Natural Resources	Qualifying		3
4-2-8-1(d)(1)	.....do	Disqualifying	1	1
4-2-8-1(d)(2)	.....do	.....do		1
4-2-8-2(a)	Site Ownership and Control	Qualifying		3
5-1(a)(1)	System	.....do		3
5-1(a)(2)	.....do	.....do		3
5-1(a)(3)	.....do	.....do		3
5-2-1(a)	Population Density and Distribution.	.....do		3
5-2-1(d)(1)	.....do	Disqualifying	1	1
5-2-1(d)(2)	.....do	.....do	1	1
5-2-1(d)(3)	.....do	.....do		1
5-2-2(a)	Site Ownership and Control	Qualifying		3
5-2-3(a)	Meteorology	.....do		3
5-2-4(a)	Offsite Installations and Operations.	.....do		3
5-2-4(d)	.....do	Disqualifying	1	1
5-2-5(a)	Environmental Quality	Qualifying		3
5-2-5(d)(1)	.....do	Disqualifying		1
5-2-5(d)(2)	.....do	.....do	1	1
5-2-5(d)(3)	.....do	.....do	1	1
5-2-6(a)	Socioeconomic Impacts	Qualifying		3
5-2-6(d)	.....do	Disqualifying		1

FINDINGS RESULTING FROM THE APPLICATION OF THE QUALIFYING AND DISQUALIFYING CONDITIONS OF THE TECHNICAL GUIDELINES AT MAJOR SITING DECISIONS—Continued

Section 960	Guideline	Condition	Siting decision	
			Potentially acceptable	Nomination and recommendation
5–2–7(a)	Transportation	Qualifying		3
5–2–8(a)	Surface Characteristics	.....do		3
5–2–9(a)	Rock Characteristics	.....do		3
5–2–9(d)	.....do	Disqualifying		1
5–2–10(a)	Hydrology	Qualifying		3
5–2–10(d)	.....do	Disqualifying		1
5–2–11(a)	Tectonics	Qualifying		3
5–2–11(d)	.....do	Disqualifying	1	1

[49 FR 47752, Dec. 6, 1984, as amended at 66 FR 57335, Nov. 14, 2001]

APPENDIX IV TO PART 960—TYPES OF INFORMATION FOR THE NOMINATION OF SITES AS SUITABLE FOR CHARACTERIZATION

The types of information specified below are those that the DOE expects will be included in the evidence used for evaluations and applications of the guidelines of subparts C and D at the time of nomination of a site as suitable for characterization. The types of information listed under each guideline are considered to be the most significant for the evaluation of that guideline. However, the types of information listed under any particular guideline will be used, as necessary, for the evaluation of any other guideline. As stated in §960.3–1–4–2, the DOE will use technically conservative assumptions or extrapolations of regional data, where necessary, to supplement this information. The information specified below will be supplemented with conceptual models, as appropriate, and analyses of uncertainties in the data.

Before site-characterization studies and related nongeologic data gathering activities, the evidence is not expected to provide precise information, but, rather, to provide a reasonable basis for assessing the merits or shortcomings of the site against the guidelines of subparts C and D. Consequently, the types of information described below should be interpreted so as to accommodate differences among sites and differences in the information acquired before detailed studies.

The specific information required for the guideline applications set forth in appendix III of this part is expected to differ from site to site because of site-specific factors, both with regard to favorable and potentially adverse conditions and with regard to the sources and reliability of the information. The types of information specified in this appendix will be used except where the findings set forth in appendix III of this part can be arrived at by reasonable alternative means

or the information is not required for the particular site.

*Section 960.4–2–1 Geohydrology.*

Description of the geohydrologic setting of the site, in context with its geologic setting, in order to estimate the pre-waste-emplacement ground-water flow conditions. The types of information to support this description should include—

- Location and estimated hydraulic properties of aquifers, confining units, and aquitards.
- Potential areas and modes of recharge and discharge for aquifers.
- Regional potentiometric surfaces of aquifers.
- Likely flow paths from the repository to locations in the expected accessible environment, as based on regional data.
- Preliminary estimates of ground-water travel times along the likely flow paths from the repository to locations in the expected accessible environment.
- Current use of principal aquifers and State or local management plans for such use.

*Section 960.4–2–2 Geochemistry.*

Description of the geochemical and hydrochemical conditions of the host rock, of the surrounding geohydrologic units, and along likely ground-water paths to locations in the expected accessible environment, in order to estimate the potential for the migration of radionuclides. The types of information to support this description should include—

- Petrology of the rocks.
- Mineralogy of the rocks and general characteristics of fracture fillings.
- Geochemical and mechanical stability of the minerals under expected repository conditions.
- General characteristics of the ground-water chemistry (e.g., reducing/oxidizing conditions and the principal ions that may